

Executive Summary

Indiana policy efforts have brought additional focus to reading since 2010. Early legislative initiatives emphasized the importance of students mastering foundational reading skills by the end of grade three to foster academic success in grade four and beyond.

Indiana's students demonstrated promising results following implementation of new reading policies with performance averaging 85% on IREAD-3, Indiana's third grade reading assessment. However, Good Cause Exemptions given for large numbers of Special Education and English Learners have led to diminished long-term success for these students. Furthermore, the academic impact resulting from the COVID-19 pandemic has resulted in drops in performance on both IREAD-3 and the English/Language Arts portion of the Indiana's annual ILEARN assessment. Black, Hispanic, Special Education and English Learner student populations have been the most impacted by the pandemic.

To better serve students who were historically underserved, and to help mitigate the impact of the pandemic, Indiana will support the implementation of research-based practices aligned to the Science of Reading. The Science of Reading is not a program or curriculum in itself but offers a research-based and multi-faceted approach to reading instruction.

As part of this plan, Indiana will train and embed instructional coaches for school corporations based on criteria identifying student populations of greatest need. Implementation of the coaching model will begin in Fall 2022, with ongoing research efforts aimed at ensuring sustainability of this model long term.

NOTE: The Indiana Department of Education developed this document in collaboration with Indiana educators and key stakeholders. It was informed by conversations with other external state agencies navigating literacy policy along with internal state agencies driving essential priorities for Indiana students.

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Section 1: Introduction and Overview

Indiana's Vision and Mission for Literacy Achievement

Vision:

The Indiana Department of Education (IDOE) will collaborate with Indiana educators to implement the Science of Reading beginning in early learning to increase student literacy achievement on statewide assessments to develop graduates prepared to succeed.

Mission:

The Indiana Literacy Plan seeks to create a collaborative and sustainable model of preparing, educating and supporting Indiana educators on the Science of Reading and the importance of early learning. The Indiana Department of Education (IDOE) will support this achievement through high-quality, ongoing, data-driven professional development at the school and teacher levels. IDOE will partner with teacher preparation programs to strengthen the pipeline of highly-qualified teachers to Indiana classrooms.

Literacy Defined:

Literacy involves a continuum of learning that enables individuals to achieve their goals, develop their knowledge and potential, and participate fully in their community and wider society. Literacy is a means of identifying, understanding, interpreting and creating the communication of facts, ideas and well-formulated opinions. These skills are essential in our increasingly digital, information-rich and fast-changing world (Montoya, 2018).

Guiding Principles

The following principles provide the foundation for Indiana's Literacy Plan. IDOE wants to empower all Indiana educators with the philosophy represented by these guiding

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principles. Prioritizing these beliefs will progress literacy education for all Indiana students from birth to adulthood.

1. Literacy is acquired beginning at birth.
2. Literacy is a fundamental part of the human experience.
3. Literacy is a trait that requires and creates a connection (i.e., relationship) with others.
4. Literacy empowers individuals for learning and self-advocacy.
5. Literacy is the collective responsibility of every individual in a community to foster communication through information exchange.

Providing Context: Prior Initiatives to Improve Indiana's Literacy Performance

Indiana has taken several steps to increase requirements and improve literacy skills for students. In 2017, the Indiana General Assembly enrolled IC 20-32-8.5-2, which required the evaluation of foundational reading standards at the end of grade three. Pursuant to the act, IDOE collaborated with Indiana educators to develop the Indiana Reading Evaluation and Determination (IREAD-3) assessment. IREAD-3 is a multiple-choice assessment that measures foundational reading standards and is administered to grade three students each spring. Since 2013, Indiana has required all students in kindergarten through third grade receive a minimum of 90 minutes of uninterrupted, dedicated time for a research-based core reading program daily. This program provides a scope and sequence in which to scaffold the instruction of scientifically-based reading, including phonological awareness, phonics, fluency, vocabulary, and comprehension.

During the same time period, Indiana implemented a law that gives schools the option to retain students who do not pass the third-grade summative assessment, IREAD-3. Schools may determine that some students need to be retained in third grade. Students who do not pass IREAD-3 may be promoted to fourth grade and receive fourth grade instruction in all subject areas. However, these students must receive comprehensive

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third grade reading instruction, remediation, and participate in IREAD-3 testing either until a passing score is achieved or a Good Cause Exemption is granted. This policy is designed to ensure students attain foundational reading skills. Good Cause Exemptions are provided by schools for special education students, English Learners or students who have been retained for two years as a means for them to access subsequent grade level content, while IREAD-3 determined the students did not meet foundational reading skills.

In May of 2018, a law was passed emphasizing early identification of reading difficulties. All public and charter schools in Indiana were required by IAC 20-35.5, or “the dyslexia law,” to screen all students in kindergarten, first, and second grade for the characteristics of dyslexia in the first 90 days of school. The universal screener considers six distinct subsets: phonological awareness, alphabet knowledge, sound-symbol recognition, decoding, rapid automatized naming, and encoding. If students fall below the benchmark on the universal screener, then parents are notified, information is shared with families about dyslexia, and permission is sought to give an additional level one screener to gather more information on the students' measure of performance. Schools use the level one and universal screener data to design an intervention plan using multi-tiered systems of support (MTSS) to address the individual student's deficient areas. Schools must ensure that data is collected to track student performance.

Section 2: Review of Current Data and Academic Impact

This section explores assessment data that provides high-level information about Indiana's student literacy and broad context for this Indiana Literacy Plan. The assessments serve a variety of purposes, ranging from a national comparison of reading skills to a measurement of foundational reading skills at grade three for Indiana students. Indiana utilizes several summative assessments and are noted in further detail by accessing this link: <https://www.in.gov/doe/students/assessment/>. This analysis defines the outcomes for four general research questions:

- What is the overall performance for grade three reading?
- What is the performance by the student group for grade three reading?
- How does Indiana reading performance compare nationally?
- What is the academic impact for students as a result of the COVID-19 pandemic?

Overall Performance for Grade Three Reading

The majority of third graders in Indiana demonstrate proficiency with foundational reading skills, as indicated by IREAD-3, but over half of all grade three students are approaching or below proficiency in English/Language Arts (ELA) as indicated by ILEARN. ILEARN is given to students in grades 3-8, and further assesses comprehension beyond foundational reading skills otherwise assessed on IREAD-3.

In general, overall proficiency has remained around 80-85 percent following spring and summer retest windows in IREAD-3 for the last decade. Students that do not pass remain at risk, with specific student groups often comprising a higher portion of these students who are not yet proficient readers. Based on later ILEARN and ISTEP+ data, these students often are not receiving the reading support they need in later grades.

While the overall pass rate for our students has maintained an average of 87.2 percent total passing over the last decade, the data reveals deficits in certain student groups.

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One example is students who qualify for special education. From 2012-2021, this student group has been approximately 30 percentage points behind their general education peers in IREAD-3. This is the largest disparity of any student group compared. Additional student groups, including students receiving free/reduced lunch, racially and ethnically diverse, and English Learners have also consistently been at least 10 percentage points behind students who are not economically disadvantaged, white, and non-English Learners as seen in both 2013 and 2021 results demonstrated below. Many students in these student groups (i.e., special education or English Learner) qualify for Good Cause Exemptions. The data below demonstrates IREAD-3 pass rates with and without Good Cause Exemptions in place.

Figure 1. 2013 IREAD-3 First Time Pass Results (Without Good Cause Exemption)

SPRING ONLY 2013 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	155	182	85.2%
Asian	1,487	1,720	86.5%
Black	6,449	9,093	70.9%
Hispanic	6,714	8,696	77.2%
Multiracial	3,289	3,891	84.5%
Native Hawaiian or Other Pacific Islander	44	53	83.0%
White	53,017	58,367	90.8%
Free/Reduced price meals	32,768	41,169	79.6%
Paid meals	38,870	41,546	93.6%
General Education	64,387	70,857	90.9%
Special Education	7,248	11,858	61.1%
English Language Learner	3,196	5,023	63.6%
Non-English Language Learner	68,415	77,666	88.1%
Female	35,870	40,453	88.7%
Male	35,954	42,480	84.6%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	65,723	76,495	85.9%
Non-Public	6,129	6,474	94.7%
Total	71,852	82,969	86.6%
*Totals may not match due to "Unknown" students			

Figure 2. 2013 IREAD-3 Summary Results (With Good Cause Exemption)

SPRING & SUMMER 2013 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	149	149	89.8%
Asian	1,556	1,556	89.5%
Black	7,656	7,656	80.5%
Hispanic	7,852	7,852	85.1%
Multiracial	3,607	3,607	91.2%
Native Hawaiian or Other Pacific Islander	43	43	84.3%
White	55,692	55,692	94.3%
Free/Reduced price meals	35,964	35,964	87.0%
Paid meals	40,230	40,230	96.4%
General Education	67,994	67,994	95.6%
Special Education	8,198	8,198	68.8%
English Language Learner	3,770	3,770	74.6%
Non-English Language Learner	72,396	72,396	92.8%
Female	38,004	38,004	93.0%
Male	38,591	38,591	89.9%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	70,233	70,233	90.9%
Non-Public	6,358	6,358	97.0%
Total	76,595	76,595	91.4%
*Totals may not match due to "Unknown" students			
Students are counted in the above totals once regardless of how many times they attempted the test.			

Figure 3. 2021 IREAD-3 First Time Pass Results (Without Good Cause Exemption)

SPRING ONLY 2021 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	94	130	72.3%
Asian	2,076	2,557	81.2%
Black	5,353	9,837	54.4%
Hispanic	6,409	10,382	61.7%
Multiracial	3,213	4,314	74.5%
Native Hawaiian or Other Pacific Islander	48	80	60.0%
White	42,666	51,974	82.1%
Free/Reduced price meals	24,899	38,192	65.2%
Paid meals	34,939	41,046	85.1%
General Education	53,921	66,273	81.4%
Special Education	5,917	12,965	45.6%
English Language Learner	4,274	7,750	55.1%
Non-English Language Learner	55,564	71,488	77.7%
Female	30,054	38,674	77.7%
Male	29,805	40,600	73.4%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	54,547	73,242	74.5%
Non-Public	5,312	6,032	88.1%
Total	59,859	79,274	75.5%
*Totals may not match due to "Unknown" demographic information			
Spring test period only results for first time takers, does not include summer retests			

Figure 4. 2021 IREAD-3 Summary Results (With Good Cause Exemption)

SPRING & SUMMER 2021 IREAD 3 RESULTS			
Student Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
American Indian	103	137	75.2%
Asian	2,178	2,600	83.8%
Black	6,378	10,284	62.0%
Hispanic	7,249	10,573	68.6%
Multiracial	3,569	4,449	80.2%
Native Hawaiian or Other Pacific Islander	53	86	61.6%
White	46,108	52,690	87.5%
Free/Reduced price meals	28,392	39,108	72.6%
Paid meals	36,429	40,465	90.0%
General Education	57,871	66,335	87.2%
Special Education	6,984	13,331	52.4%
English Language Learner	4,274	5,921	72.2%
Non-English Language Learner	60,580	73,727	82.2%
Female	32,717	39,398	83.0%
Male	32,921	41,421	79.5%
School Demographic	IREAD PASS N*	IREAD TEST N	IREAD Pass %
Public	59,978	74,683	80.3%
Non-Public	5,660	6,136	92.2%
Total	65,638	80,819	81.2%
*Totals may not match due to "Unknown" demographic information			
Students are counted in the above totals once regardless of how many times they attempted the test.			

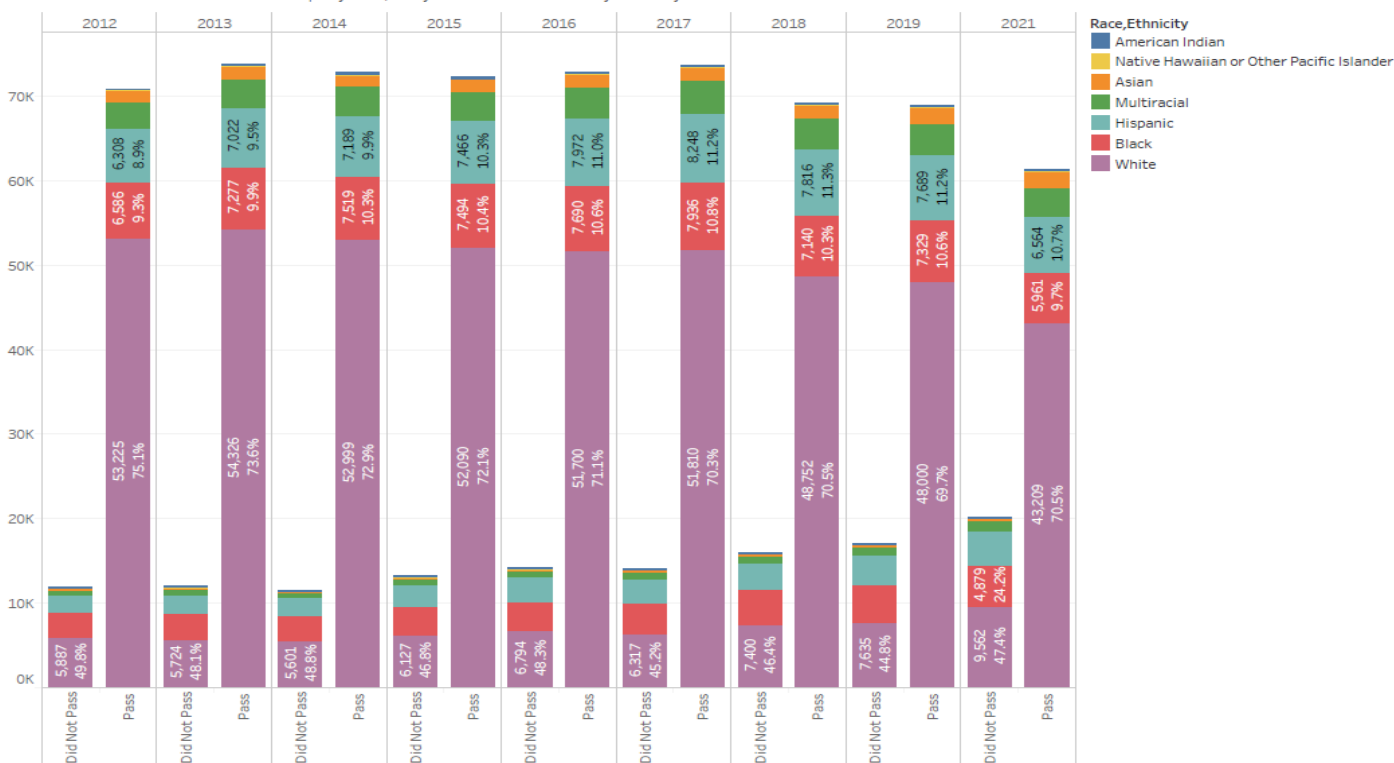
Grade Three Reading Performance Analysis

Discrepancies exist among various student groups in proficiency levels, with some racially and ethnically diverse students, students in special education, students receiving free/reduced lunch, and English learners performing significantly below other student groups on both the IREAD-3 and ILEARN assessments. These discrepancies exist among students demonstrating proficiency both with foundational reading skills and associated reading comprehension assessed with ILEARN ELA. Discrepancies in growth were further exacerbated by disruptions to learning in 2020 and 2021 due to the COVID-19 pandemic.

Figure 5. Student Group Performance and Good Cause Exemption Status

Race & Ethnicity Results by Year

These counts include all students that tested in the spring each year and received a "Pass" or "Did not pass" result. They are not the "best of" results that are posted online. This is because the 2021 IREAD summer administration is not yet completed. If a student took the IREAD in multiple years, they are counted in each year they took the assessment.



Sum of Tested Indicator for each Content Proficiency broken down by School Year Id. Color shows details about Race, Ethnicity. The marks are labeled by count of Student Id and % of Total Count of Student Id. The view is filtered on Content Proficiency and Race, Ethnicity. The Content Proficiency filter keeps Did Not Pass and Pass. The Race, Ethnicity filter excludes Unknown.

Indiana Reading Performance Compared Nationally

According to the most recent data available from National Assessment of Educational Progress (NAEP), Indiana is on track with the national averages in reading performance among the general population of students. However, more than half of students, both nationally and within Indiana, are performing below proficiency in reading according to NAEP's measurement levels, which are defined as basic, proficient, and advanced.

Average scale scores for NAEP reading in grades four and eight show Indiana performing slightly higher than the national average in 2019 (National Center for

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Education Statistics, 2021). Indiana remains higher than the national average; however, recent assessment results indicated a small decrease in performance further emphasizing support is needed in reading.

While Indiana is keeping with the national trend overall, more than half of Indiana grade three and eight students are performing at “NAEP Basic” and “Below NAEP Basic” levels (see charts below for percentages at each level).

Figure 6. NAEP 2019 Grade Four Performance

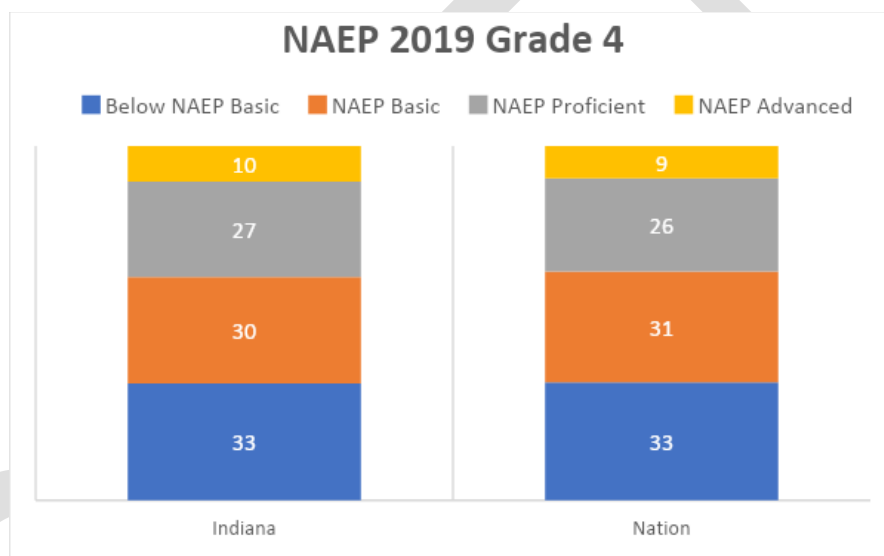
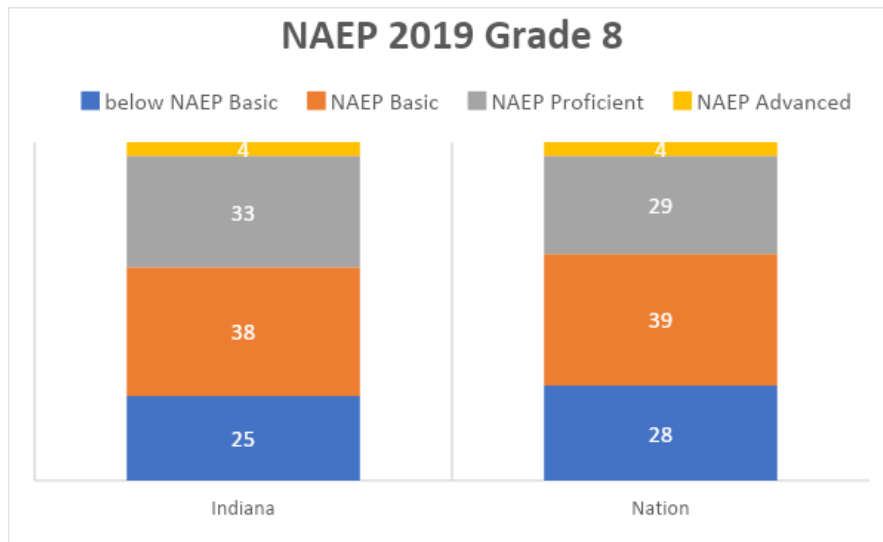


Figure 7. NAEP 2019 Grade Eight Performance



Academic Impact as a Result of the COVID-19 Pandemic

The COVID-19 pandemic has significantly impacted student learning across Indiana, exacerbating pre-existing disparities in learning. Students experienced moderate-to-substantial impacts that may require one or more years of supplemental academic support to recover simply to pre-pandemic performance. Most students were impacted academically. In isolated contexts where modest-to-no impacts were observed, there are some concerns and questions about the efficacy of literacy instruction prior to COVID-19. Additional information related to the collaborative study with the National Center for Assessment is available via the Executive Summary of the Indiana Academic Impact Analysis [here](#).

The following academic impact data include mathematics and ELA, beginning in third grade as third grade often signifies the shift from learning to read to reading to learn. Students require reading skills to break down sentences and access vocabulary in other disciplines, including mathematics. As ELA impact is notably affected, other subjects are likely impacted by ELA skills concurrently.

Figure 8. Overall Academic Impact (English/Language Arts and Mathematics)

Grade	Academic Impact	
	ELA	Mathematics
3	Moderate-Significant	Significant
4	Moderate-Significant	Significant
5	Moderate-Significant	Significant
6	Moderate-Significant	Significant
7	Moderate-Significant	Significant
8	Moderate-Significant	Significant

Figure 9. Academic Impact for Special Education and General Education Learners

Special Education Status	Academic Impact	
	ELA	Mathematics
Special Education	Moderate-Significant	Moderate
General Education	Moderate-Significant	Significant

Figure 10. Academic Impact by Student Groups

Ethnicity	Academic Impact	
	ELA	Mathematics
American Indian	Moderate-Significant	Significant
Asian	Significant	Significant
Black	Significant	Significant
Hispanic	Significant	Significant
Multiracial	Moderate-Significant	Significant
Native Hawaiian or PI	Moderate-Significant	Significant
White	Moderate-Significant	Significant

Figure 11. Academic Impact for English Learners

English Learner Status	Academic Impact	
	ELA	Mathematics
English Learner	Significant	Significant
Non-English Learner	Moderate-Significant	Significant

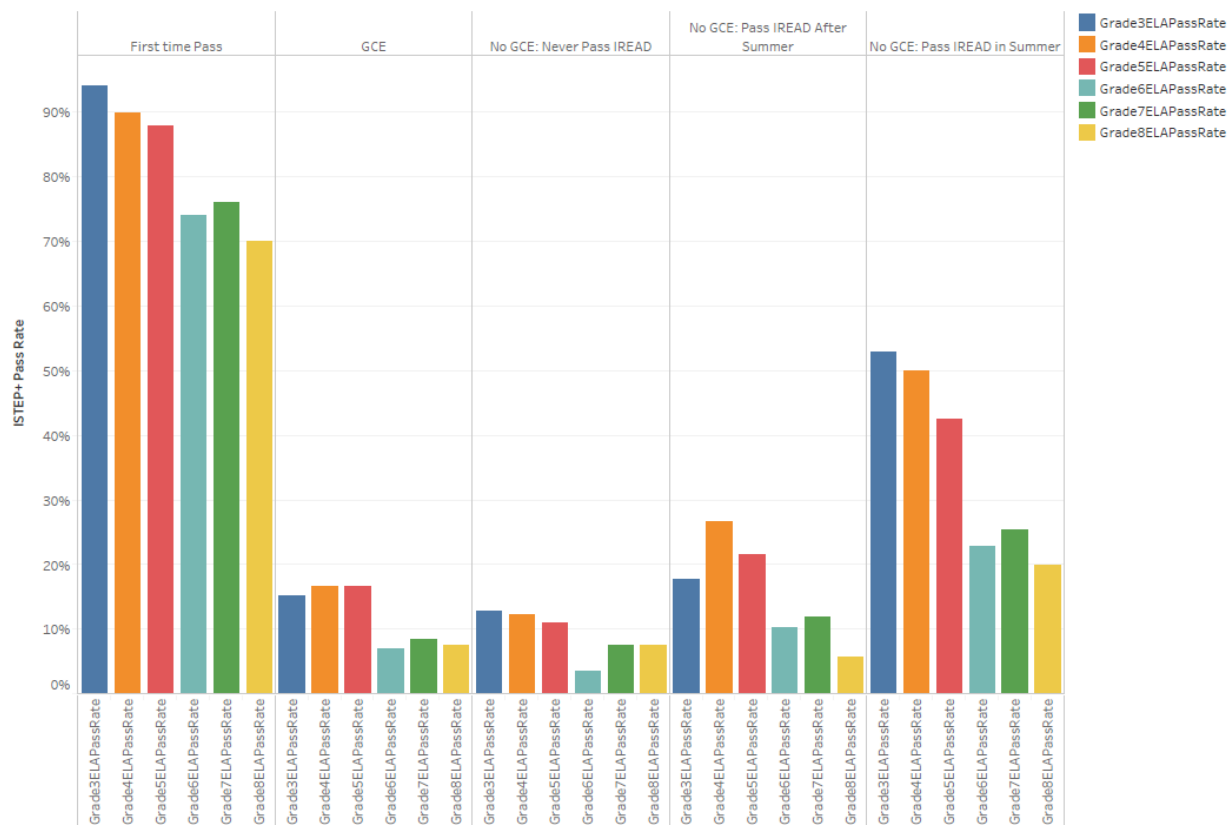
Finally, students who were granted a Good Cause Exemption following IREAD-3 showed very little difference from students who did not receive a Good Cause Exemption in passing rates (pass or fail) on future ELA ISTEP+ tests based on a cohort following students' 2012 IREAD-3 and 2017 ISTEP+ scores.

These data sets lead us to consider if students receive needed support and literacy interventions following IREAD-3 and if the support and intervention they receive are effective at improving foundational reading skills.

Figure 12. ISTEP+ Performance Over Time

ELA ISTEP+ Pass Rates by 2012 IREAD Group

This looks at a cohort of students that took the IREAD in Spring 2012 and received a "pass" or "did not pass" score. For example: the grade 8 pass rate is the ISTEP+ pass rate of students that took the 8th grade ISTEP+ in 2017 and received a "pass" or "did not pass" on the Spring 2012 IREAD.



Grade3ELAPassRate, Grade4ELAPassRate, Grade5ELAPassRate, Grade6ELAPassRate, Grade7ELAPassRate and Grade8ELAPassRate for each Student Type GCE Combined. Color shows details about Grade3ELAPassRate, Grade4ELAPassRate, Grade5ELAPassRate, Grade6ELAPassRate, Grade7ELAPassRate and Grade8ELAPassRate.

Current Challenges and Solutions for Improving Indiana Literacy

Specific challenges were identified in IDOE's analysis of the data and the Literacy Plan proposes solutions to support academic recovery within Indiana based on these academic impact and performance data sets. Specifically, those challenges include:

1. Special education, English Learner, racially and ethnically diverse, and economically disadvantaged student groups perform below academic peers on reading assessments.
2. Students who do not pass IREAD-3 matriculate to grade four lacking foundational reading skills, and this pattern continues throughout students' educational journey.

Therefore, Indiana will address the priorities of refining core reading instruction to follow researched best practices utilizing data-based decision making; developing targeted professional development; and providing targeted interventions, remediation, and enrichment to ensure accessible opportunities for all students.

Solution 1: Offer Opportunity for Science of Reading Implementation

IDOE has been inspired by the success of several states, such as Mississippi, Louisiana, and Florida, that have improved their students' literacy achievement by implementing literacy plans aligned with the Science of Reading. The Science of Reading is a term used to describe the body of research about "reading, reading development, and best practices for reading instruction" (Petscher et al., 2020).

The first solution to increase students' literacy achievement is to implement evidence-based literacy practices based on the Science of Reading – a large body of scientific research on reading, reading development, and reading instruction (Defining Movement, 2021; Petscher et al., 2020). IDOE will offer an opportunity for partnerships with teachers, schools, and corporations to align their early literacy instruction in

kindergarten through grade three with this body of research (further described in Section 3).

Solution 2: Developing Professional Educators in Quality Instructional Practices for the Science of Reading

The second solution to improve students' literacy achievement is to provide coaching and professional development aligned with the Science of Reading to educators. The implementation plan allows for two consecutive efforts to identify schools for coaching: high-need schools serving racially and ethnically diverse student populations as well as those desiring to use the training and support in Science of Reading as a voluntary coalition. The IDOE will define criteria based on IREAD-3 and ILEARN performance by student group, comparison of Good Cause Exemption and retest performance reflecting student supports. IDOE will procure and oversee coaches to support schools over a three-year period. These coaches will offer support and guidance as well as provide professional development and coaching to empower educators in the implementation of the Science of Reading and the evidence-based instructional practices aligned with it. For those schools engaging in the voluntary coalition, IDOE will train literacy coaches.

Section 3: Science of Reading, Structured Literacy, and Balanced Literacy

The purpose of this section is to provide an overview of the body of research known as the Science of Reading¹ for education professionals and stakeholders in Indiana. This research underlies Indiana Literacy Plan for Academic Recovery.

The Science of Reading Defined:

The Science of Reading is a term used to describe the body of research about “reading, reading development, and best practices for reading instruction” (Petscher et al., 2020).

¹ Adapted from *Dyslexia toolkit: An anthology of resources and materials to support the implementation of dyslexia interventions* (pp. 9-40), by K. J. Williams and J. M. Risch, 2021, Indiana Department of Education; Indiana University Bloomington (<https://www.doe.in.gov/sites/default/files/literacy/dyslexia-toolkit-feb-21.pdf>).

There are several important facts about this body of research (Defining Movement, 2021; Petscher et al., 2020):

1. **It is interdisciplinary.** These studies have been conducted by numerous independent researchers from separate, but connected, fields such as education, psychology (e.g., cognitive, developmental, school), linguistics, neuroscience, implementation science, etc.
2. **It is substantial and well-established.** It encompasses thousands of studies that have been conducted over the past 50 years.
3. **It is high-quality and scientifically-based.** These studies use methods and procedures that are “rigorous, systemic, and objective” (ESSA, S.1177 - 114th Congress 2015). This means that researchers have used designs (e.g., experimental, quasi-experimental, meta-analysis, correlational) aligned with held research questions, administered assessments that are valid and reliable, employed appropriate procedures to analyze data, and reported their findings in peer-reviewed journals.

It is also important to identify some common misconceptions about the Science of Reading. “The Science of Reading is not:

- An ideology or philosophy;
- A fad, trend, new idea, or pendulum swing;
- A political agenda;
- A one-size-fits-all approach;
- A program of instruction; or
- A single, specific component of instruction, such as phonics.” (Defining Movement, 2021)

The Importance of the Science of Reading

Far too many adolescents leave school without proficiency in the literacy skills required to achieve their postsecondary goals and participate fully in their community and society (National Center for Education Statistics, 2021). Although many factors contribute to low literacy levels, it is important for schools and education professionals to focus on malleable factors. One of these factors is providing educators with high-quality professional development and training about the Science of Reading, which includes information about reading and the structure of language, reading development, and effective practices for instruction (Moats, 2020a; Seidenberg & Borkenhagen, 2020). The focus of this literacy plan is to help educators better understand the Science of Reading to identify and implement effective instructional practices that can prevent reading difficulties and support literacy progress.

Understanding Reading: The Simple View of Reading and Scarborough's Reading Rope

The Simple View of Reading (SVR) is one model of reading that describes the component skills that contribute to reading comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). This model is supported by substantial evidence from numerous scientific studies conducted over the past 40 years. In the Simple View of Reading, reading comprehension is viewed as the product of two component skills: decoding and linguistic comprehension (Gough & Tunmer, 1986; Hoover & Gough, 1990). Decoding, a word-level skill, involves the ability to retrieve words rapidly and efficiently from memory. For example, an individual who is proficient in decoding sees the written spelling for the word "hat" and automatically retrieves the correct pronunciation for the word (/h/ /ă/ /t/); however, decoding by itself is not sufficient for an individual to comprehend text. The other component of the Simple View of Reading is linguistic (language) comprehension, which involves constructing and interpreting the meaning of words (Gough & Tunmer, 1986; Hoover & Gough, 1990). Linguistic comprehension requires in-depth knowledge about (Moats, 2020; Scarborough, 2001):

- Morphology – the smallest units of language that have meaning (i.e., prefixes, suffixes, roots, base words);

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- Semantics – the meaning of words, phrases, and sentences;
- Syntax – grammatical structures and parts of speech;
- Background knowledge – prior knowledge about the subject matter;
- Verbal reasoning – inferencing, figurative language; and
- Literacy knowledge – print concepts and genres.

The word “simple” in the Simple View of Reading is often misleading. It does not mean that reading is a simple process, but instead identifies the two main components (decoding and linguistic comprehension) that contribute the most to overall reading comprehension. Both decoding and linguistic comprehension are necessary for individuals to comprehend text, but it is also important to understand that comprehension is the product of these two skills (Gough & Tunmer, 1986; Hoover & Gough, 1990). This means that individuals will have difficulty comprehending text if they can decode words but do not understand what those words mean or if they can understand what words mean but cannot decode them. The complexity of the Simple View of Reading is also illustrated in Scarborough's Reading Rope (2001)—a diagram that depicts the relationship between decoding and linguistic comprehension. As individuals become more skilled at reading, they develop increasing speed and accuracy in the areas of decoding and linguistic comprehension. Additional information regarding the Simple View of Reading and Scarborough's Reading Rope can be found below.

- [Learning to Read: The Simple View of Reading Infographic](#) (Baker et al., 2017)
- [Scarborough's Reading Rope: A Groundbreaking Infographic](#) (International Dyslexia Association, 2019)

Reading and the Human Brain

Almost all humans are born with the natural ability to speak and listen, but they are not born with the natural ability to read and write (Moats, 2020). This is because reading and writing are relatively recent cultural inventions (approximately 5,000 to 10,000 years old), which have only become more widely used in the past 500 years (Moats, 2020). This means that the human brain is not biologically “pre-wired” for reading and writing

(Dehaene, 2009), and humans must be explicitly taught to connect speech to written language (Castles et al., 2018).

Reading is a complex process, but recent advances in neuroscience and brain imaging (e.g., functional magnetic resonance imaging) have allowed researchers to identify three main areas of the brain that are involved in reading (Kearns et al., 2019):

- Frontal Lobe – The inferior frontal gyrus in the frontal lobe is responsible for processing and storing speech sounds.
- Temporoparietal Area – This area connects letters (graphemes) with speech sounds (phonemes) and processes the meaning of words and sentences.
- Occipitotemporal Area – This area is responsible for processing visual information (i.e., recognizing letters and words) and word meanings.

These areas of the brain are connected by two main pathways when individuals are reading (Kearns et al., 2019):

1. Dorsal (Decoding) Pathway – involved in sounding out letters and words
2. Ventral (Sight Recognition) Pathway – involved in reading words accurately and automatically by sight

Why do these areas and pathways matter?

When children first learn to read words, they mainly activate the dorsal (decoding) pathway in the brain which allows them to connect a word's sounds (phonemes) to its letters (graphemes) and meaning (Castles et al., 2018). To become proficient at word-reading (i.e., the decoding component of the Simple View of Reading), children need to automatically connect a word's letters to its meaning. When this happens, the ventral (sight recognition) pathway is activated, which is quicker and more efficient than the dorsal pathway (Castles et al., 2018). Using the ventral pathway also frees up the brain's working memory and allows children to focus on higher-level linguistic skills and text comprehension (Fletcher et al., 2018; LaBerge & Samuels, 1974; C. A. Perfetti, 1985). If children do not develop accurate and automatic word-reading skills, then they

must constantly rely on the slower dorsal pathway to decode words, which can cause difficulties with spelling, word-reading, and text comprehension (Castles et al., 2018; Perfetti, 2007).

Word-Reading and Spelling Development

Although the Simple View of Reading describes the skills necessary for proficient reading, it is a fixed model, and does not describe how these skills develop over time (Hoover & Tunmer, 2018). As young children begin learning to read, they start to understand the alphabetic principle—the idea that letters (graphemes) are used to represent sounds (phonemes) in spoken words (Castles et al., 2018; Scarborough, 2001). This understanding that phonemes map to graphemes develops across several phases/stages (Castles et al., 2018; Ehri, 1998):

- **Pre-Alphabetic** – pre-reading stage where young children do not make letter-to-sound connections; “reading” is based on visual cues
- **Partial Alphabetic** – children begin to connect some phonemes to graphemes, but these representations are not complete
- **Full Alphabetic** – children develop more complete representations of words and their phoneme-grapheme relationships
- **Consolidated Alphabetic** – individuals have acquired a large bank of words they can read by sight (i.e., automatically and accurately) and now recognize larger units of language in words such as syllables and morphemes

Children progress across similar developmental phases/stages for spelling (Ehri, 2005; Treiman & Kessler, 2005); however, spelling is often more difficult for children to acquire than word-reading (Bosman & Van Orden, 1997; Ehri, 2000; C. A. Perfetti, 1997; Treiman, 2017). Spelling requires children to learn to visually identify letters by their shape and to physically produce those shapes (Treiman & Kessler, 2005). Proficient spelling also requires individuals to acquire in-depth knowledge about phonological (sound), graphotactic (written), and morphological (structure) patterns in words (Treiman, 2017).

Word-reading and spelling are complementary processes (Ehri, 2000). In other words, learning about spelling facilitates word reading and vice versa. As children repeatedly associate phonemes to graphemes and larger units of language (also known as orthographic mapping), these associations become ingrained in the memory and easier to retrieve with automaticity (Ehri, 1998; Ehri, 2005). Formal spelling instruction has also demonstrated significant, positive effects on students' reading achievement (Graham & Santangelo, 2014).

Scientifically-Based Reading Instruction

In addition to research about reading and reading development, the Science of Reading includes numerous scientific studies about effective reading instruction and intervention, including what to teach (content) and how to teach it (methods and practices). The results from these studies have been synthesized in numerous systematic reviews and meta-analyses and have important implications for teaching literacy to students in grades K-12.² One approach to literacy instruction that is aligned with the Science of Reading and incorporates these effective, scientifically-based literacy practices is known as Structured Literacy. In the following section, we describe Structured Literacy approaches and contrast them with typical or balanced approaches commonly used in classrooms.

Structured Literacy Defined

Structured Literacy (SL) is a scientifically-based approach to literacy instruction that is aligned with the Science of Reading and the body of research on effective instructional practices for all learners (International Dyslexia Association, 2019b; Spear-Swerling, 2019). Educators who use a Structured Literacy approach teach all components of language (the content), including phonology, sound-symbol relationships, orthography, morphology, syntax, and semantics (International Dyslexia Association, 2019b). These components of language also overlap considerably with the essential components of

² Connor et al., 2014; Edmonds et al., 2009; Foorman et al., 2016; Gersten et al., 2009; Herrera et al., 2016; Kamil et al., 2008; Reed, 2008; Scamacca et al., 2015, 2016; Shanahan et al., 2010; Wanzek et al., 2016, 2018; Wexler et al., 2008

reading identified by the National Reading Panel's report on reading instruction (National Reading Panel, 2000):

- **Phonemic Awareness** – the ability to identify, think about, and manipulate the smallest sounds (phonemes) in language;
- **Phonics** – a method for teaching phoneme-grapheme correspondences for reading and spelling;
- **Fluency** – the ability to read a text accurately, automatically, and with expression;
- **Vocabulary** – understanding and using words in oral and written language; and
- **Comprehension** – the ultimate goal of reading: understanding what is read.

It is important to note that each of these components are highly-connected and should not be taught as distinct skills. For example, phonemic awareness, phonics, and fluency are a part of decoding or word recognition in the Simple View of Reading, whereas vocabulary is a part of linguistic comprehension. Comprehensive literacy programs that use a Structured Literacy approach emphasize the aforementioned components of language and reading.

Essential Features of Structured Literacy Methods

In Structured Literacy, content is taught with specific methods containing the following key features:

1. **Explicit and Direct** – Lessons are fully-guided, which means that teachers clearly explain learning goals, provide adequate models and demonstrations, scaffold students' learning through guided and supported practice, and provide appropriate independent practice (Archer & Hughes, 2010; Clark et al., 2012). Teachers never expect students to guess or infer the skills or content to be learned (Clark et al., 2012).
2. **Systematic** – Lessons are highly-structured with a planned scope and sequence (International Dyslexia Association, 2019a).

3. **Sequential** – Skills in lessons are sequenced logically (i.e., easier or prerequisite skills are taught before more difficult skills) and each lesson builds upon previously taught skills (Archer & Hughes, 2010).
4. **Cumulative with On-Going Review** – Lessons include frequent opportunities to review previously learned skills alongside new skills (Archer & Hughes, 2010; International Dyslexia Association, 2019b).
5. **Interactive** – Lessons provide frequent opportunities for students to respond and interact with the teacher (Archer & Hughes, 2010; Wanzek et al., 2014).
6. **Immediate Feedback** – Teachers provide immediate feedback that is specific and goal-directed to help students improve their performance (Archer & Hughes, 2010; Hattie & Timperley, 2007).

Structured Literacy and Balanced Literacy in Elementary Classrooms

Balanced (or typical) approaches to literacy instruction are commonly implemented in many elementary classrooms. These approaches may lack the essential content and methods aligned with the Science of Reading that are necessary to improve students' reading achievement (Moats, 2007). These approaches are often based in the whole language theory of reading and three-cueing system, which emphasize meaning-based instruction and the belief that readers use cues (e.g., semantic, syntactic, and graphophonic) to pronounce words (Hempenstall, 2014). When a student comes to an unknown word, the teacher may ask the student to use these cues to figure out how to pronounce the word: "Does it make sense? Does it sound right? Does it look right?" Instead of reading decodable books with previously taught letter-sound, students practice reading predictable, leveled, or trade books (Spear-Swerling, 2019). These predictable and leveled texts include many unfamiliar words, and teachers may tell students to look at the pictures to figure out how to read these unknown words. Additionally, critical phonemic awareness and decoding skills may be taught, but are rarely done so in an explicit, systematic, or sequential manner (Spear-Swerling, 2019).

Balanced or typical approaches to literacy instruction may also use instructional practices and learning activities that are only partially-guided, and therefore require students to infer or implicitly learn various reading skills. Students often spend most of the reading block working with partners or independently to practice reading skills (Moats, 2007; Spear-Swerling, 2019). Balanced literacy approaches and programs are not well-aligned with the Science of Reading, and therefore it is unlikely that these approaches and programs will meet the needs of all learners, including students with and at-risk for reading disabilities. If our goal is to improve literacy achievement for all students, schools and educators must select and implement instructional practices and programs that are aligned with Structured Literacy and the Science of Reading.

Instructional Implications of the Science of Reading for Early Learning

Developing language and early literacy skills begins during early learning efforts; consequently, Indiana's priorities are designed to reach all children, including those from infancy to age five and not yet in a K-12 setting. All of the domains of a child's early development are interrelated and interdependent. Therefore, a wider focus on all foundational content areas is necessary as language and early literacy development does not just live in the "English/Language Arts" Early Learning Foundation. Yet, access to a high-quality, evidence-based, early childhood curriculum aligned to Indiana's Early Learning Foundations can be cost-prohibitive for many early learning providers. Early literacy does not mean early reading instruction or teaching infants to read; it is the natural development and progression of a variety of skills. It is the importance of positive interactions between infants and families as well as the critical role of literacy-rich experiences, based on principles in high-quality, early learning curricula. It is the development of oral language and learning the meaning of words. As referenced earlier, background knowledge is critical for young children beginning to read. When children are not familiar with a word, they will not hold context or meaning to understand what it is, and therefore will read without comprehension. While the Science of Reading calls for explicit instruction, this must be balanced in early childhood with time and space for children to play. Play is when children develop and improve oral language skills, which culminates in incorporating what they have learned into group time with educators.

Instructional Implications of the Science of Reading in Grades Three through 12

The Science of Reading has implications for improving literacy for students in grades three through 12. It is critical that educators working with older students develop their knowledge about evidence-based instructional practices to improve literacy; therefore, IDOE plans to compile professional development resources related to the Science of Reading accessible to teachers, schools, and corporations serving all grade levels.

Examples of the Science of Reading Initiatives Across the U.S.

Over the past decade, several states and school corporations have implemented Science of Reading initiatives designed to improve their elementary-age students' literacy achievement. In 2011, 78 percent of Mississippi's fourth grade students scored below the proficient level in reading on the National Assessment of Educational Progress (NAEP) (National Center for Education Statistics, 2021). Their fourth graders scored higher than only one other state, New Mexico, as well as the District of Columbia. As a result, the state enacted a new law, the *Literacy Based Promotion Act* (*Literacy Based Promotion Act. Mississippi State, 2013*), which included training in scientifically-based reading instruction and intervention (aligned with the Science of Reading) for preservice and in-service teachers and higher-education faculty, in addition to reading coaches to support teachers in the field. Since this act was implemented, Mississippi's fourth grade students have demonstrated significant improvements on the NAEP reading assessment (RMC Research Corporation, 2019). As of 2019, 68 percent of their fourth-graders scored below the proficient level in reading on NAEP, and Mississippi was the only state in the nation to see a significant improvement in fourth grade reading achievement from the 2017 to 2019 administration of NAEP (National Center for Education Statistics, 2021).

Similarly, in 2015, the chief academic officer for Bethlehem School District in Bethlehem, Pennsylvania, noticed that more than half of the third grade students in the district were at or below the proficient level on their statewide reading assessment (Hanford, 2018). They implemented a plan to train principals and teachers in the Science of Reading, specifically using *Language Essentials for Teachers of Reading*

(Moats & Tolman, 2019), and also discontinued using Balanced Literacy programs and practices (Hanford, 2018). Kindergarten students were assessed annually on a reading screening assessment known as the *Dynamic Indicators of Basic Early Literacy Skills* (University of Oregon, 2021). In 2015 (before implementing the the Science of Reading-aligned training), only 47 percent of kindergarteners were at or above the benchmark level on DIBELS; however, by 2018 (after the Science of Reading- aligned training), 84 percent of kindergartners were at or above the benchmark level (Hanford, 2018).

It is important to note that the findings from Mississippi and Bethlehem School District are not from experimental studies. This means that the Literacy Based Promotion Act and Language Essentials for Teachers of Reading and Spelling training did not *cause* improved reading achievement, but they were *positively associated* with improved reading outcomes for students. Without experimental control, it is impossible to know what other external factors may have influenced reading achievement in this state and district; however, these results do highlight important considerations for other states and districts as they move to align their instructional practices with the Science of Reading.

Section 4: Implementation Plan

As stated in this document, Indiana defined specific needs as a result of the data analysis. Most specifically, the implementation plan highlights two parallel paths for implementation in the coming years.

First, a subset of schools will be identified to collaborate with IDOE to implement the Science of Reading. This model intends for active participation by the school to ensure success. IDOE will collaborate with the corporation and school leadership to assign a literacy coach to a building, interviewed and confirmed by IDOE staff. IDOE will pay for the associated salary and services of the assigned coach. The coach's primary duties will be training, oversight, modeling, and implementation of the Science of Reading practices. The coach's responsibilities will be governed by IDOE. The criteria used to select schools will be based on IREAD-3 and ILEARN performance alongside the application of Good Cause Exemptions and later retest opportunity performance. Coaches will continually receive training and support over time, allowing calibration

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across sites within Indiana. The coaches are intended to serve as a leader in disseminating information at the local level. IDOE expects significant training for coaches, school administration, and school staff beginning in summer of 2022.

Secondly, IDOE intends to offer the same opportunities to additional cadres of instructional coaches beginning in summer of 2022. Corporations and schools outside of the critical need defined above may opt-in as part of a voluntary coalition. Through this effort, minimum assurances and expectations will be defined for participation. Schools and corporations will be responsible for recruiting, paying, and overseeing implementation locally for this model. IDOE intends to provide collaboration and training opportunities at no cost for those utilizing the voluntary coalition. Participation in this model will be capped annually to ensure diligence and oversight of the implementation by IDOE and locally.

Coaching Model

As noted above, IDOE intends to use a coaching model for implementation. In schools, the purpose of coaching is to provide consistent, job-embedded support to teachers based on research-based practices. IDOE will provide transformational coaching to help teachers make appropriate changes to behavior that will improve student outcomes through the implementation of the Science of Reading. Research supports the effectiveness of coaching, and at its foundation, it has resulted in an “increase [of] the instructional capacity of schools and teachers, a known prerequisite for increasing learning” (Neufeld & Roper, 2003). The increase in instructional capacity leading to increased learning is the ultimate goal of all schools. IDOE is excited to provide this support to Indiana schools that demonstrate the greatest need, with the long-term goal of building a model for all schools. Coaching, because of its emphasis on the involvement of educators as well as administrators and ongoing professional development, encourages program sustainability.

Research supports that the greatest benefit to coaching, as a form of professional development, is that the support is job-embedded and continuous (Darling-Hammond et al., 2017). When educators receive consistent and relevant support that can be used specific to the needs of their students and themselves, they have a greater likelihood of implementing new instructional practices or carrying out new initiatives with fidelity. Because the Indiana Literacy Plan for Academic Recovery is rooted in the importance of early literacy instruction's focus on the Science of Reading, it requires that teachers are well-trained, regularly-supported, and continuously-developed. This accessibility to support is the missing piece for the majority of educator professional development. Providing a coach in high-need schools will give teachers a common source of guidance and information that is necessary for them to seek improvement and change. It will also support and encourage a community of professionals continuing to learn from each other.

In addition to yielding results in student achievement, coaching provides high-quality professional development. In a study of student achievement before and after the implementation of a coaching model, "There was a significantly greater percentage of students scoring at proficiency and a significantly smaller percentage of students scoring at risk in schools where coaches spent more time working with teachers" (Bean, 2010). These outcomes have been replicated in multiple states like Mississippi and Louisiana that have also used coaching as the main strategy to improve student literacy achievement. Specifically, Neufeld and Roper (2003) outline the positive improvements resulting from implementing a coaching model:

- Translation of teacher development into classroom practice as a result of coaching;
- A willingness among teachers to share their practice with one another and seek learning opportunities from peers and coaches as well as a willingness to assume collective responsibility for their students' learning;
- High-quality principal leadership of instructional improvement;

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- Successful school cultures based on instruction being the focus of teacher and principal interaction;
- Instructional advancement informed by achievement data.

Supporting Student Needs

Indiana data identifies specific student groups as areas of greatest need, most specifically students with disabilities and English Learners. Current Indiana policy allows students to seek a Good Cause Exemption following the assessment of foundational reading skills through IREAD-3. This assessment policy allows for the Good Cause Exemption to be granted, and then matriculation to the subsequent grade occurs.

The implementation plan for Indiana must deliver training to coaches regarding thoughtful, continued support for student populations with tiered instruction. Indiana policy intends to allow flexibility, but further evidence highlights the need for continued support. IDOE will offer guidance for coaches on:

- How to best support the needs of specific student populations;
- How to create or update individualized support plans for students;
- How to design and write appropriate goals; and
- How to monitor the progress of foundational reading skills over time.

After receiving a Good Cause Exemption, students with disabilities and English Learners will need additional, focused reading instruction directed at those skill deficiencies revealed by the Individual Student Report. These documents, for [students with disabilities](#) and [English Learners](#), walk educators and families through how to support students who qualify for the Good Cause Exemption.

Subsequently, the implementation plan relies on the collaboration of other content-area educators reinforcing key aspects of literacy, including research and comprehension in later grades. As such, the Indiana Literacy Plan for Academic Recovery includes interdisciplinary reading and support for educators in this area

by identifying schools with the highest academic need and providing training in the Science of Reading.

Supporting students is a critical priority for this work. We believe targeting efforts to those critically underserved allows the greatest impact to achieve success in this program.

Early Learning and Secondary Educators

Indiana's plan for support focuses on a coaching model and professional development for educators teaching kindergarten through second grade, but the literacy plan is designed to be comprehensive and includes support for students before and after those targeted years.

Infancy to age five programs should utilize an evidence-based curriculum that aligns with the Early Learning Foundations. Indiana intends to provide financial support to identified schools, or community-based preschools that feed into identified schools, in the selection of curriculum to be utilized. In addition, infancy to age five educators are also encouraged to participate in professional development on the topic of early literacy as it relates to the developmental stages of the students they are serving. Finally, IDOE intends to support the use of a common assessment among identified schools.

Secondary educators must also have access to knowledge of evidence-based, instructional practices to support literacy through professional development, Professional Learning Communities, and other available resources. Additionally, Indiana must investigate and provide recommendations for support options to accelerate literacy growth in all students.

Once the Indiana Literacy Plan for Academic Recovery is fully implemented and sustained, higher student outcomes on summative assessments and college- and career-readiness benchmarks from pre-kindergarten through grade 12 will be evident. IDOE will partner with teacher education programs to include explicit instruction in the Science of Reading literacy practice and implementation to sustain progress in the future.

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